

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A process for manufacturing bake hardening steel sheet comprising:
 - the smelting of a steel, the composition of which comprises, expressed in % by weight:

0.03 ≤ C ≤ 0.06
0.50 ≤ Mn ≤ 1.10
0.08 ≤ Si ≤ 0.20
0.015 ≤ Al ≤ 0.070
N ≤ 0.007
Ni ≤ 0.040
Cu ≤ 0.040
P ≤ 0.035
S ≤ 0.015
Mo ≤ 0.010
Ti ≤ 0.005

it being understood that the steel also contains boron in an amount such that:

$$0.64 \leq \frac{B}{N} \leq 1.60$$

the balance of the composition consisting of iron and impurities resulting from the smelting;

- the casting of a slab of this steel, this slab then being hot rolled in order to obtain a sheet, the end-of-rolling temperature being above that of the Ar3 point;
- the coiling of said sheet at a temperature of between 500 and 700°C; then
- the cold rolling of said sheet with a reduction 30 ratio of 50 to 80%;

- a continuous annealing heat treatment which is carried out for a time of less than 15 minutes; and
- a skin pass which is carried out with a reduction ratio of between 1.2 and 2.5%,
wherein the continuous annealing heat treatment comprises a first cooling operation comprising a slow first part carried out at a rate of less than 10°C/s, followed by a rapid second part carried out at a rate of between 20 and 50°C/s.

2. (currently amended): The process as claimed in claim 1, characterized in thatwherein said continuous annealing heat treatment comprises:

- a reheat of the steel until it reaches a temperature of between 750 and 850°C;
- an isothermal soak;
- athe first cooling operation down to a temperature of between 380 and 500°C; and
- an isothermal soak; and then
- athe second cooling operation down to the ambient temperature.

3. (canceled).

4. (currently amended): The process as claimed in any one of claims 1 to 3claim 1 or 2, characterized in thatwherein, in addition, the manganese content and the silicon content of the steel are such that:

$$4 \leq \frac{\%Mn}{\%Si} \leq 15.$$

5. (currently amended): The process as claimed in any one of claims 1 to 4~~claims 1 or 2, characterized in that~~wherein, in addition, the manganese content of the steel is between 0.55 and 0.65% by weight and the silicon content of the steel is between 0.08 and 0.12% by weight.

6. (currently amended): The process as claimed in any one of claims 1 to 4~~claims 1 or 2, characterized in that~~wherein, in addition, the manganese content of the steel is between 0.95 and 1.05% by weight and the silicon content of the steel is between 0.16 and 0.20% by weight.

7. (currently amended): The process as claimed in any one of claims 1 to 6~~claims 1 or 2, characterized in that~~wherein, in addition, the nitrogen content of the steel is less than 0.005% by weight.

8. (currently amended): The process as claimed in any one of claims 1 to 7~~claims 1 or 2, characterized in that~~wherein, in addition, the phosphorus content of the steel is less than 0.015% by weight.

9. (currently amended): A bake hardening sheet that can be obtained by the process as claimed in any one of claims 1 to 8~~claim 1 or 2, characterized in that~~wherein the sheet has a composition comprising, expressed in % by weight:

0.03 ≤ C ≤ 0.06
0.50 ≤ Mn ≤ 1.10
0.08 ≤ Si ≤ 0.20
0.015 ≤ Al ≤ 0.070
N ≤ 0.007
Ni ≤ 0.040
Cu ≤ 0.040
P ≤ 0.035
S ≤ 0.015
Mo ≤ 0.010
Ti ≤ 0.005

it being understood that the steel also contains boron in an amount such that:

$$0.64 \leq \frac{B}{N} \leq 1.60$$

the balance of the composition consisting of iron and impurities it and has a yield strength of between 260 and 360 MPa, a tensile strength of between 320 and 460 MPa, a BH2 value of greater than 40 MPa and a yield plateau of less than or equal to 0.2%.

10. (currently amended): The sheet as claimed in claim 9, characterized in that it wherein has, in addition, a BH2 value of greater than 60 MPa.

11. (original): A part that can be obtained by cutting a blank from a hardening sheet as claimed in claim 9 or 10, said blank then being painted and baked at less than 200°C.